Grass Seed Production on irrigated land

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Grass Seed Production on Irrigated Land

By HARRY F. OMAN, *farm superintendent*, and RUSSELL H. STARK, *nursery manager; Aberdeen, Idaho, Nursery Unit; Soil Conservation Service*

Grass seed is a new high-income cash crop in many irrigated areas. Grass can replace an annual row crop or a close-growing crop such as grain.

Irrigated land use in the West is based largely on an annual cash crop. Results of this practice are: (1) Decrease in soil fertility, (2) breakdown of soil structure, (3) decrease in water penetration, (4) increase in erosion, and (5) reduction in quality and yield of crop.

But grass, since it is a perennial crop, increases the organic matter in the soil, causing an increase in fertility and a decrease in erosion. The grass roots improve soil structure, which permits more rapid penetration of water. In addition, grass usually requires less irrigation water after the stand is established than the ordinary annual row crop. It also provides supplemental feed, such as straw or aftermath grazing. Grass has a low labor requirement and the harvest occurs during favorable weather periods.

Grass as a cash crop provides better land use than do annual crops. The manner in which the grass fits into a rotation depends upon the type of farming operations that you use. The following rotations are examples of possible ways that you may fit grass seed production into your rotation. If you are interested in livestock production, you will find rotation 2 better than rotation 1.

Rotation 1:

Year	*Crop*
1	Establish red clover.
2	Red clover seed.
3	Annual row crop.
4	Establish grass.
5, 6, 7	Grass seed.

Rotation 2:

Year	*Crop*
1	Establish hay seeding.
2, 3, 4	Hay.
5	Annual row crop.
6	Establish grass.
7, 8, 9	Grass seed.

Grain is commonly seeded as a companion crop in establishing red clover and alfalfa for hay. (A companion crop is often referred to as a "nurse crop." A better term in most instances would be "wicked-uncle crop" as it often causes more harm than good to a new seeding.) You may find some advantage in seeding red clover or alfalfa after the removal of an early grain crop. Since grain competes directly with grass during the establishment period of the grass, you cannot expect to establish a grass stand that will be successful for seed production where a companion crop is used. Such seedings produce weak grass plants and allow excessive weed growth that depresses the grass growth. The grain stubble seriously hinders cultivation of the grass stand.

It is impossible to predict seed yields except on a relative basis. Most grasses require high soil fertility for high seed yields. Seasonal weather conditions, especially extremes of high or low temperatures during the blooming period, reduce yields. When and how you irrigate and cultivate influences yields (fig. 1).

If you are a new grower, confine yourself to the production of one kind of grass. This helps you to prevent mechanical mixtures and also allows

Figure 1.—Grow grass in rows and cultivate often to get good yields and to keep out weeds.

you to become familiar with the requirements of grass seed production. Grasses are not difficult to produce once you become acquainted with the requirements.

SPECIES

Application of conservation-farming practices will cause a greater demand for different kinds of forage crops. You have a large number of different grasses adapted to seed production on irrigated land from which to select. The area you live in influences the species you choose. You have the choice of producing seed for a local market or for a market outside of your region.

Tests have shown that some strains of most grasses best suited for conservation seedings are adapted to seed production under irrigation. Smooth brome, tall fescue, crested wheatgrass, and timothy are common grasses that you may consider. You can get information regarding new or uncommon grasses from your local soil conservation district or your county agent.

TIME OF SEEDING

Factors that influence time of seeding grasses on irrigated land vary with local conditions. Seed broad-leaved species such as smooth brome or orchardgrass in the early spring (from March 15 to April 15), late spring (May 15 to June 15), or the latter part of the summer (August 1 to September 30) after an early crop has been harvested.

Seed the fine-leaved grasses such as big bluegrass or sheep fescue in the early spring or in the fall, when temperatures are lower. Certain weeds in your field may limit the time of seeding. Where heavy stands of cheatgrass or other annuals are apt to come up in the fields, seed in the late spring. Seed in the early spring in areas where summer-growing weeds, such as barnyard grass, are liable to be serious. If you seed in the late spring or late summer, make sure that there will be plenty of irrigation water available during the early establishment period.

Your work schedule on the rest of the farm also may limit the time of seeding. All perennial grasses require the equivalent of one season's growth to establish themselves. Therefore, if you seed in the spring you cannot expect a seed crop the first year. The establishment year requires the most work for weed control. If you seed one of the rapid-developing, long-lived grasses, such as tall fescue or smooth brome, in the late summer you will get a seed yield the following summer. If you seed Russian wildrye or the vernal-dominant grasses such as big bluegrass in the late summer you may not get any seed the next summer.

TYPE OF SEEDING

The type of seeding you use will be controlled by the land-capability class and the slope of your field. Row seedings can be used on land in Classes I and II, contour-row seedings on land in Classes III and IV with slopes up to 5 percent. Use solid seedings where the slope is more than 5 percent.

You need only small amounts of seed to establish grass stands on row seedings. Rates from 4 to 6 pounds per acre are adequate. Make a firm seedbed for seeding grasses, the same as for sugar beets or any of the smaller legumes.

Since the grass is a perennial that forms a large crown, you should use rows spaced at least 36 inches apart. This spacing permits proper cultivation between rows and allows roguing the stand without too much difficulty. Use wider row spacing if it is better suited to your equipment. Row seedings produce higher yields than solid seedings. On one trial conducted in Idaho, smooth brome and crested wheatgrass grown in rows produced 251-percent and 612-percent increase, respectively, over the yields of the solid seeding.

Row culture on irrigated land permits you to better control irrigation water and may also provide more uniform application over the field. In addition, you can produce a higher quality crop with less labor on row seedings than you can on solid seedings. The rows allow you to cultivate and keep the stand more free of weeds (fig. 1).

FERTILIZERS

Grasses require large quantities of nitrogen fertilizer. Applications of 60 to 90 pounds per acre more than pay for the fertilizer used in increased seed yields. On soils of high fertility, fertilizer need not be applied until after the first seed crop is harvested. On low-fertility soils use 30 to 40 pounds of nitrogen at the time of seeding the grass and then again with the same amount early the next spring. Yearly applications thereafter should be made with 60 to 90 pounds of nitrogen per acre in the early spring before the grass has started growth.

Figure 2.—Binding and shocking is the best way to harvest seed.

Trials on irrigated land in Idaho show that applications of 55 pounds of nitrogen per acre on mountain brome produced an increase of 3 pounds of seed for every pound of nitrogen applied. Other grasses should respond in about the same ratio. A trial conducted with tall oatgrass, smooth brome, and orchardgrass grown in rows spaced 3 feet apart showed that 60 pounds of nitrogen produced an average seed-yield increase of 55 percent over the unfertilized stands. At the same time, 60 pounds of nitrogen per acre applied on solid seedings produced a 79-percent increase over the unfertilized stand. You may expect to get results similar to or exceeding these.

No increase in seed yield of grasses has been produced by the use of fertilizers other than nitrogen. This may not be true for your farm. It may pay you to try other fertilizers on a few rows in your field and carefully check the results.

The time that you apply your fertilizer is important. Put on fertilizer very early in the spring before the grass has started growth. If you live in an area where weather conditions do not permit early field work, put the fertilizer on in the late fall after the grass is dormant.

IRRIGATION

New Seedings

During establishment of your grass stand make frequent and light irrigations. Don't let the soil dry out below the roots of the new seedings. During periods of high evaporation you may have to irrigate at intervals of 3 or 4 days until the grass is about 4 inches high. After this stage use a longer interval. To get efficient use of your irrigation water on light soils

or sloping land you should use shorter runs than can be used on heavy soil or flatter land. Provide plenty of moisture to keep the young grass growing all the time.

Established Stands

Established stands do not need as frequent irrigations as new seedings. Determine the need for irrigation by examining the soil to an 8-inch depth in a number of places in the field. Water penetrates faster on old stands than on new stands. You will be using enough water when you get a penetration 2 feet deep. Uniform irrigation helps you to get uniform ripening of the crop over the entire field. Overuse of water reduces the benefit of your nitrogen-fertilizer application. Such overuse costs you money in both wasted fertilizer and irrigation water.

Your grass stand needs from 2 to 4 irrigations before harvest. Irrigate after harvest frequently enough to prevent drought injury to the stand. Late fall irrigations help prevent drought injury during winter and provide moisture for early spring growth. Early spring is a critical period in grass seed production. Drought at this time reduces seed yields. In a dry spring the grass may suffer from drought before irrigation water is available in canals. If you have an irrigation well you can prevent this injury.

There will be different stages of maturity in a single seed head. Irrigating when the first seeds start to ripen may be detrimental. Too much soil moisture causes a delay in the date of ripening. As the moisture is reduced the seed matures rapidly. This may cause a high loss from shattering before the entire field can be harvested.

HARVESTING AND THRESHING

Binding the grass crop on irrigated land is the surest and best way to harvest seed (fig. 2). Grasses shatter more readily on irrigated land than on nonirrigated land. This is caused by an increase in ash content of the plant on irrigated land. If you allow the seed crop to mature enough to combine, there is danger of wind or other storms knocking out most of the seed. Combined grass seed contains too much moisture for safe storage. Grasses ripen rapidly and must be harvested within a relatively short time. Check the crop frequently when it starts to mature.

Save seed by equipping your binder with pans to catch seed that shatters in harvesting (fig. 3). Place the pans at the end of the platform draper and at the elevator draper. You may also use a canvas on the bundle carrier or replace the bundle carrier with a box or slip to catch seed shattered on the tying platform. Although you will have to remove the bundles by hand where the crop is very ripe, it will pay you to do this extra work.

Bind your crop in the firm dough stage and have it mature in the shock the same as any of the small-grain crops. Almost any kind of thresher adjusted properly will do a satisfactory job of threshing grass. Follow the recommendations in the book accompanying your combine or thresher to get satisfactory results. A machine with a rub-bar cylinder is best.

Guard against overfeeding the thresher. Grass seeds do not separate as rapidly as heavier grains. Too fast feeding causes excessive loss in the straw pile. Some growers rerun the straw piles, but if the machine is operated correctly the first time, rethreshing does not pay.

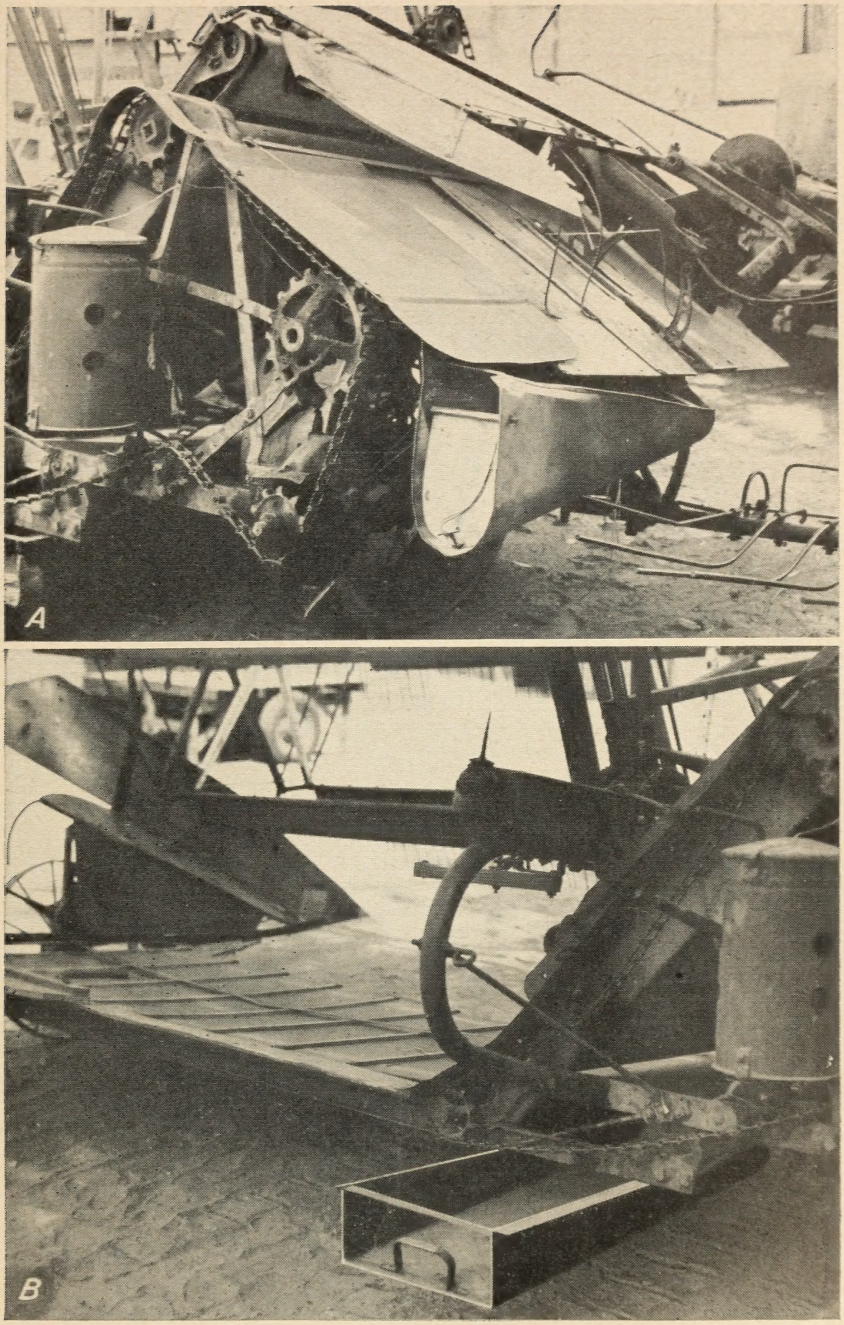

Figure 3.—Home-made appliances attached to a grain binder for harvesting grass seed: *A*, Pan at end of binder platform catches seeds that shatter while bundles are being bound; *B*, pan installed to catch seed dropping between the platform and elevator canvases.

CULTIVATION AND WEED CONTROL

Cultivate new seedings frequently to control weeds between rows. Use selective sprays such as 2,4–D to control weeds within rows. Use the selective sprays any time after the plants are 6 weeks old. Selective sprays injure some of the broad-leaved grasses more than the fine-leaved grasses. If you provide plenty of irrigation water, however, the damage caused by selective sprays will not be excessive.

Before seeding you can control some weeds by shallow cultivation with a harrow. Keep the soil moist enough to germinate weed seeds to control weeds effectively before seeding. Weedy grasses that occur within the rows must be removed by hand. If you use pure seed to begin with you will have less hand labor to do on your grass stand.

You can treat established grass stands rather roughly in the early spring before they start growth. Use a spring-tooth harrow on bunch-type grasses and a double disk on sod formers. This helps control winter annuals and volunteers that may occur. If you use a spring-tooth, run it deep enough to get most of the weeds within the rows. If you use a double disk on the sod formers, run it about 1 inch deep. Do the early spring cultivation before the plants make more than an inch of growth. This type of cultivation helps reduce the depth of the furrow between rows, a help when you harvest. Use regular cultivating equipment such as a duck-foot to cultivate between rows after the early spring operation. Cultivate only as needed to control weeds or volunteers. Do not throw the soil over the grass during cultivation. You will find that one or two cultivations before and after seed harvest are enough. Do not use selective sprays on established stands when the head has started to form in the boot.

CARE OF STAND AFTER HARVEST

You may graze the aftermath of a grass crop provided an adequate supply of irrigation water is available. Stop grazing early enough to permit at least 6 inches of regrowth before freezing weather is expected. If the grass stand is to be used for aftermath grazing, irrigate it as you would a pasture. The stand may need additional amounts of fertilizer above what would be required if the grazing were not done.

PLOWING OUT THE GRASS STAND

Plowing the grass after the last seed crop is harvested should be done in the fall. Disk the sod as deep as possible before plowing. Plow about 5 inches deep on the contour or cross slope on sloping land. After plowing, disk the sod once or twice to break up the clumps of roots. Leave the soil rough over winter to help conserve moisture and prevent water and wind erosion.

You will be able to prepare a better seedbed for following crops on a sod that is fall-plowed and left rough over winter. You can use the land for a crop such as grain or for a new seeding of a legume. The undecomposed sods may cause difficulty in cultivating and harvesting row crops.

Remember that soils plowed out of a grass stand will rapidly absorb irrigation water. The time needed for proper irrigation may be much less than was needed before the grass was grown. Check the depth of water penetration to prevent overuse of water.

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